

### *A tale of two fires*

The fires that swept across 1.4 million acres of the greater Yellowstone area during the summer of 1988 provided compelling evidence of both the power of natural forces and the determination of human nature to bring such forces under control. The fires can be tallied many ways: an estimated 249 fires started in greater Yellowstone, including 45 that began in the park and 5 that started outside and moved in, most of them eventually burning together into eight major fire complexes. There were crown fires, ground fires, and “back-fires” that were deliberately set to try to halt the advancing flames. But afterward, only two kinds of fire seemed to matter: the inevitable ecological event that a landscape underwent as part of a long-term process of renewal, and the wrenching human event that people experienced firsthand or on television.

### **Fire as an Ecological Event**

Although often regarded as a tourist mecca rather than a place to commune with nature, the greater Yellowstone area contains one of the largest remaining wildland areas in the continental United States. Rather than providing the stage for some “balance of nature” suggested by the sunny views of abundant wildlife found in tourist brochures, this Rocky Mountain ecosystem is always changing—from day to day, year to year, and one millenium to the next. Even Old Faithful, named for its alleged reliability, isn’t immune to subterranean influences on its eruptions, and a severe winter or fire can trigger a series of shifts in the number and distribution of plant and animal species.

Despite what Smokey Bear would have us believe, most fires in western forests are caused by lightning, which is not something we’ve figured out how to prevent. In contrast to the traditional “fire is bad” message, lightning-ignited fires are now often referred to as “beneficial” to wildland areas. But as a force of nature, like sunshine and rain, fire will tend to be regarded as good or bad depending on how it affects your own interests.



*A beauty not in the eye of every beholder*

Instead of fleeing in a Bambi-style panic, Yellowstone's wildlife generally went about their activities as usual and lost few lives to the smoke or flames. But what about the osprey whose nest in a fire-damaged tree is swept downstream in the increased runoff from burned slopes? Or the moose that starves without the canopy of an old growth forest to keep the snow from burying his winter food supply? In a place where the primary goal is to protect ecological processes with a minimum of human interference, looking for "benefits" can get in the way of understanding a force that may disrupt wildlife as well as human routines. Although some plants and animals fare better immediately after a fire than they did before, others find it harder to survive. Then, as time passes and conditions change, the advantages shift to other species. The reason to accept the presence of fires in Yellowstone is not because they are "good," but because they are intrinsic to its ecology.

### Fire as a Human Experience

The Yellowstone fires sent mixed smoke signals to their human observers. At the same time that park managers were engaged in an often fruitless effort to persuade the public that the fires were not an ecological disaster, they were helping the surrounding national forests and communities spend \$120 million in a largely futile battle to put the fires out.

More than most forces of nature, such as earthquakes and hurricanes, forest fires provoke frustration because we can often intervene in them to some extent. We may accept our inability to halt an erupting volcano, but fires that burn for months across thousands of acres of land yank away our illusion of fire as something that long ago, in the dawn of human civilization, we learned to control for our own use. Ultimately, according to the official post-fire assessment, the effort made by thousands of firefighters during the summer of 1988 protected buildings, but probably did not significantly reduce the acreage burned in the Yellowstone area.



Since the last glaciers retreated, fire has been one of the forces that determine which plants grow in the Yellowstone area and which animals will survive in such a landscape. To try to eliminate fire in order to keep Yellowstone looking "the way it's supposed to" would be as logical as trying to prevent the rain showers that can spoil a visitor's day. Whether they realize it or not, people come to Yellowstone to see the results of fire and other ecological processes.

Nor did the acreage burned reduce the human presence in Yellowstone, although the efforts to prevent damage to park buildings and private property tested the limits of human endurance. In addition to taking the lives of two firefighters, the fires were a cause of hardship or at least inconvenience for many people who lived in the area, and a source of distress for many Yellowstone enthusiasts. National parks are generally thought of not as evolving landscapes but as collections of photogenic views that our tax dollars are used to keep unchanged. But such a goal for Yellowstone, even if it were feasible, would not be appropriate. Instead, Yellowstone is a repository for the ecological processes that have shaped it, whatever challenges and difficult decisions those processes may pose at times. Just because people who visited the park before 1988 may remember Yellowstone as a place of abundant old-growth lodgepole pine forests, does not mean that is what it always was or always will be.

This may be of no comfort to the grizzly bear whose source of whitebark pine seeds has been reduced, or to the local outfitter for whom the summer of '88 was a financial disaster. But unsparing as the truth may be, Yellowstone's primary mission is not to fill their stomachs. While recognizing the park's role as part of the surrounding human community, we must look beyond the consequences of a drought-stricken summer to a Yellowstone that will endure for the human and wildlife communities to come.

## Yellowstone in the Year 2000

The Yellowstone area has always had its extreme aspects. In 1856, a Kansas City newspaper editor rejected as “patent lies” the reports of trapper Jim Bridger describing Yellowstone as “the place where Hell bubbled up.” But its thousands of spouting geysers and steaming mudpots were the main reason that Yellowstone became the world’s first national park two decades later. They also provide a constant reminder of its proximity to the elemental forces that shaped the planet. The park’s petrified forests remain as evidence of the sub-tropical trees that were buried by mudslides eons ago, while “extremophiles”—primitive microorganisms that can survive in the boiling temperatures of Yellowstone’s thermal areas—have proved their usefulness in modern technology.

Hence, despite the many witnesses to Yellowstone’s hell-like qualities in the summer of 1988 who thought, “I can’t believe this is happening,” there was a certain aptness to the fact that it *was* happening—that this particular crown jewel of the national park system was burnished by such an extreme rash of crown fires. Compared to the cataclysmic eruption that took place in the middle of Yellowstone 630,000 years ago, spewing volcanic ash across much of North America and destroying all life for thousands of square miles, the changes wrought by the fires of 1988 appear rather trifling, and have been less dramatic than was expected.

Unlike in Alaska, where research has shown that fires stimulated willow growth, Yellowstone’s fires did not resuscitate its waning willow stands as some people had hoped. Nor, as some people feared, did the openings created by fire let in new invasions of non-native plants. The fires did make some long-term changes in habitat and food sources for many wildlife species, but generally with less impact on population numbers than a severe winter would have. Thousands of charred trees remain standing or have fallen over, but a dead tree can be a lively place, a home and source of food for insects and birds that provide food for other animals. In ecological terms, the fires were just another chapter in a book whose pages keep turning.

Similarly, the effect of the fires on human activities has been less than many people were predicting in the fall of 1988. Park visitation, which has fluctuated over the years in response to a variety of factors, dropped 15% in 1988 from the prior year, but climbed to a record high of 2.7 million in 1989, and has continued to remain above that level despite entrance fee increases. These numbers are important because they indicate that Yellowstone is still a place that people want to visit, and that the drop in local tourism revenues, like the decline in greenery, was only temporary. But the people who say, “Yellowstone will never be the same again” are absolutely right: with or without a battalion of firefighters, Yellowstone cannot be kept the same. Change happens.

There are some people, especially in the gateway communities that were hardest hit economically and psychologically during the summer of 1988, who have not forgiven park managers for “letting Yellowstone burn.” But within a few years, most of the park’s critics could be found foraging in other fields of controversy: some believe park policies have caused a deplorable increase in elk or a decline in bears, or that even one wolf is one too many; that there are too many snowmobiles or too few roads groomed for snowmobile use; that park managers should stop trying to “play God,” or that they should be doing a better job of it.



Although enormous fires may be a perfectly natural phenomenon that has been recurring in Yellowstone for millennia, the fires of 1988 happened to occur at a time when they posed a major dilemma for the human species.

Yet although the reports of Yellowstone's death in 1988 were greatly exaggerated, so were the announcements of its "rebirth" that began to emerge along with the first post-fire seedlings. Its fire management policy has been refined, but Yellowstone did not need to be reborn because it had not died. Its ecological processes have continued to function without interruption, producing year after year of new plant growth and new generations of wildlife. Twelve years later, lightning-caused fires that pose no risk to human life or property are still permitted to burn in Yellowstone under certain conditions, and we are still humbled by the power of wildland fire.

### The Debate Continues

The 2000 fire season has broken records in many areas of the West outside of Yellowstone, and drought conditions have meant that some fires remained out of control for weeks despite the best efforts of firefighters using the best that modern technology has to offer. The problems began in May when a prescription burn set by Bandelier National Monument to reduce hazardous fuel loads escaped its intended perimeter and destroyed homes in local communities. The fire season came to a close in September with criticisms that the federal government had not done enough to prevent the summer's conflagrations through the use of prescription burns.

While large fires are incompatible with the human communities that now cover much of the United States, research has shown that they are not only consistent with the mission of Yellowstone National Park, but essential in order to let Yellowstone continue to be Yellowstone. The park cannot be born again, but it will burn again.

It is beyond the scope of this book to resolve the debate about what could have or should have been done about the fires of 1988, to determine whether too many bulldozers were used too soon or too few arrived too late, to decide whether the fires could have been halted by more quickly and aggressively suppressing the first ignitions, or whether in the driest summer in the park's history, Yellowstone received too many backcountry lightning strikes to fend them all off. The purpose here is to explain the evolution in the park's fire management policy and the consequences of that policy and the ecological forces with which it must contend. One indisputable benefit of the fires is the opportunity they have provided to learn from watching how Yellowstone has responded in the aftermath—both its human participants and its ecology. Some of what we have discovered since 1988 is summarized in this book. The answers to other questions will not be known until future chapters are completed, after our lifetimes.



*August 1988: Old Faithful Geyser is temporarily upstaged by a less enduring aerial display.*

## Yellowstone's Clouded Crystal Ball

### What has not happened since 1988

Whether you agree that Yellowstone became “a blighted wasteland for generations to come,” as announced by one U.S. Senator in 1988 is a matter of personal opinion. But of the more quantifiable predictions that were made about the fires’ long-term consequences, there is not yet any evidence that the following have come to pass:

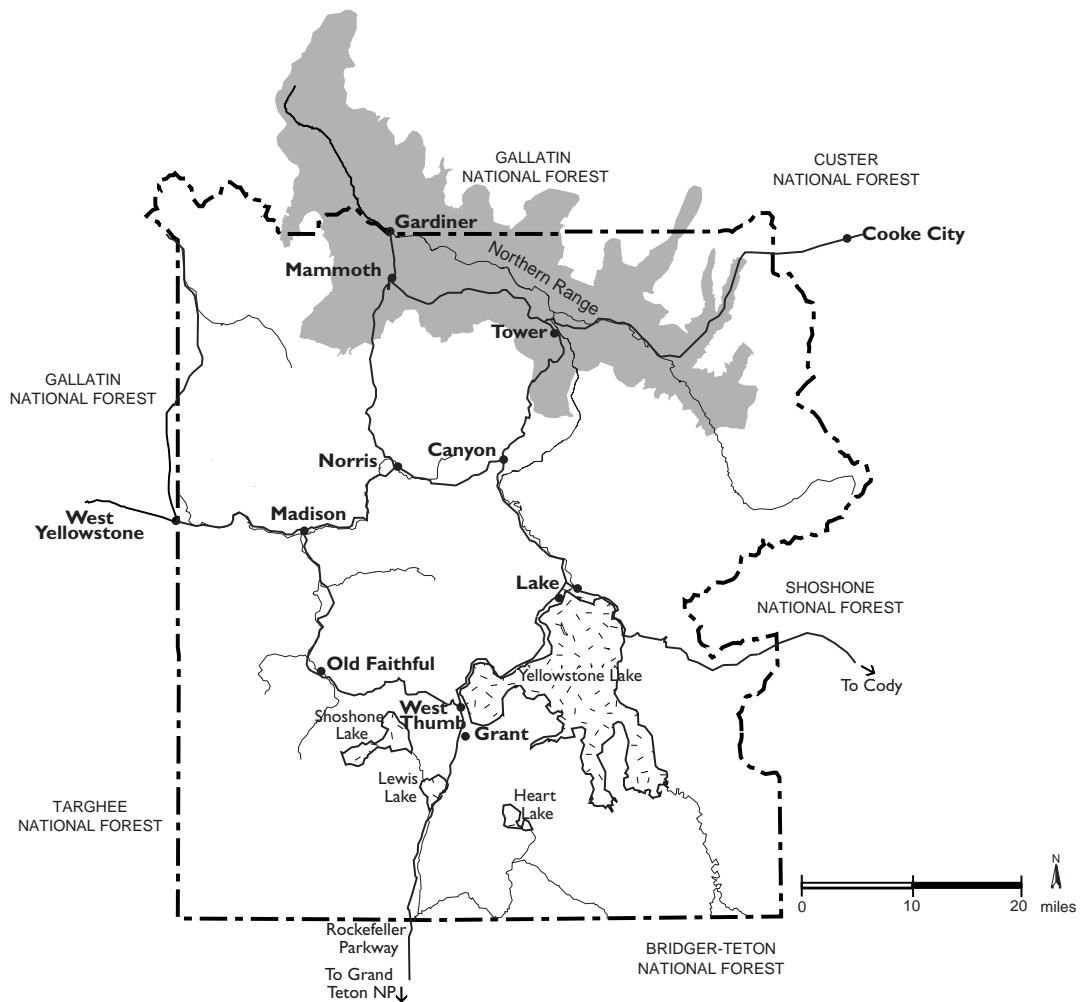
- Ø A long-term drop in park visitation.
- Ø Flooding downstream of the park because of increased runoff on bare slopes.
- Ø A decline in fish populations because increased erosion silts up the water.
- Ø An increase in fish populations in smaller streams where deforestation and loss of shade could result in warmer water and higher nutrient levels.
- Ø More rapid invasion of non-native plants into burned areas and corridors cleared as fire breaks.
- Ø An increase in lynx following a boom in snowshoe hares as a result of changes in forest structure.
- Ø Increased willow vigor and production of the defense compounds that deter its browsing by elk and moose.
- Ø An increase in the elk population because of improved forage.
- Ø A decline in the endangered grizzly bear population because of smaller whitebark pine seed crops.
- Ø Another big fire season in Yellowstone because of all the fuel provided by so many dead and downed trees.
- Ø Adoption of a program of prescribed burning to reduce the likelihood of future large fires in Yellowstone.

### What has changed

Although some of the long-term consequences of the fires remain to be seen, these changes have been caused entirely or in part by the fires of 1988:

- ✓ The replacement of thousands of acres of forest with standing or fallen snags and millions of lodgepole pine seedlings.
- ✓ The establishment of aspen seedlings in areas of the park where aspen had not previously existed.
- ✓ A decline in the moose population because of the loss of old growth forest.
- ✓ Shifts in stream channels as a result of debris flows from burned slopes.
- ✓ An increase in the public understanding and acceptance of the role of fire in wild-land areas.
- ✓ A stronger program to reduce hazardous fuels around developed areas.

As described in this book, researchers have documented many other changes in Yellowstone since 1988, but this list indicates the relatively small number that might be apparent or of interest to the average park visitor.



### Yellowstone at a Glance

- **Established:** In 1872, primarily to protect the area's unusual thermal features. Yellowstone contains the world's largest concentration of geysers, including the tallest, Steamboat Geyser, which erupts up to 385 feet.
- **Size:** 2.2 million acres; 63 miles from north to south, and 54 miles east to west, which makes it larger than Rhode Island and Delaware combined.
- **Topography:** About 80% is forested and 13% is meadow and grassland. About three-quarters of the park lies on a plateau with elevations ranging from about 7,000 to 9,000 feet. The highest point is Eagle Peak, 11,358 feet (3462 m).
- **Rivers and lakes:** About 5% is covered by water including more than 220 lakes and 1,000 streams. Yellowstone Lake, which covers 136 square miles and is 400 feet deep, is the largest high-elevation lake in North America.
- **Wildlife species:** More than 300 birds, 18 fish (5 non-native), 8 ungulates (1 non-native), 2 bears, and about 49 other mammalian species.
- **Developed areas:** Less than 5% of the park area has been altered to accommodate visitor use and park administration, including 370 miles of paved roads, 900 miles of trails, historic buildings, campgrounds and other facilities.